

GPS Program Status Update

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Space-Based PNT

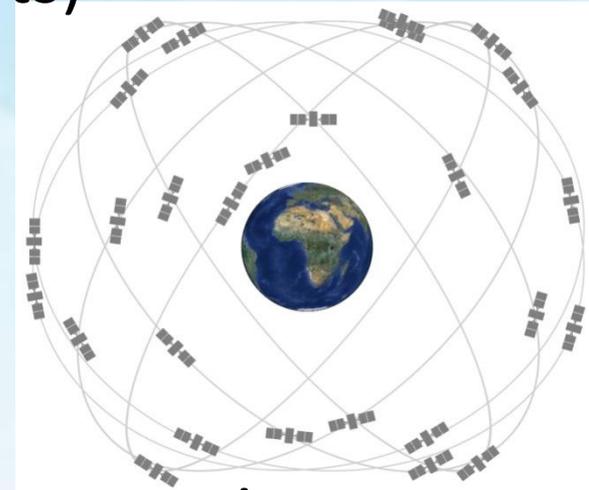
United States of America



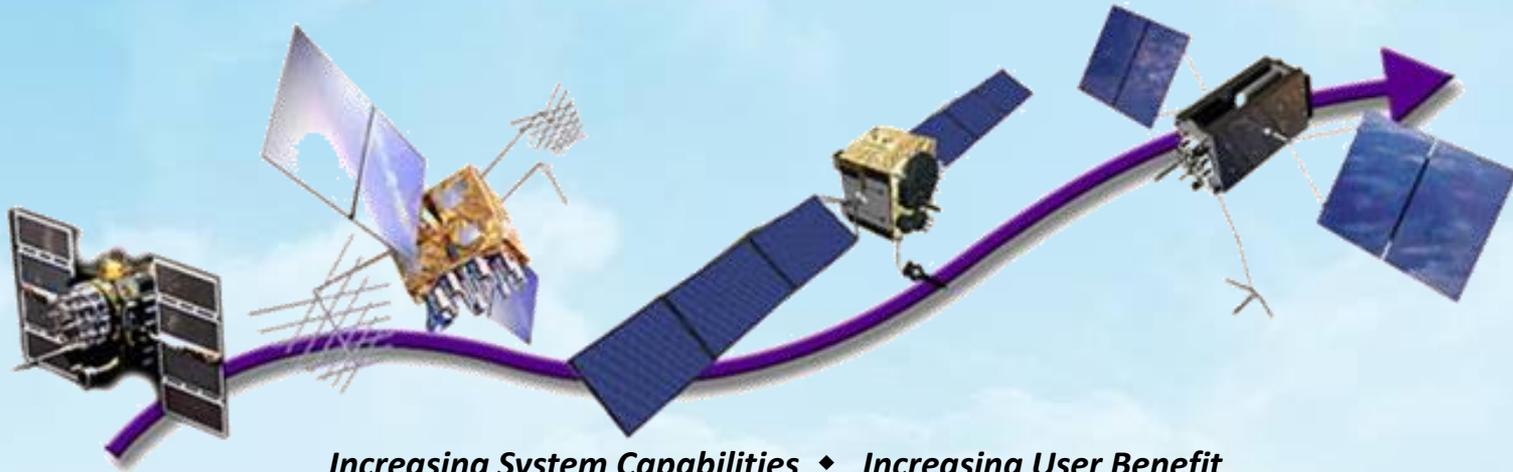
GPS Constellation Status

31 Satellites Operation As of June 2013

- Expandable 24 configuration (27 slots)
- 8 Block IIA
- 12 Block IIR
- 7 Block IIR-M
- 4 Block IIF (October 2013 launch)
- 4 residuals in orbit
- Global GPS civil service performance commitment met continuously since December 1993



GPS Modernization Program



Increasing System Capabilities ♦ Increasing User Benefit

GPS IIA/IIR

Basic GPS

- Standard Service
 - Single frequency (L1)
 - Coarse acquisition (C/A) code navigation
- Precise Service
 - Y-Code (L1Y & L2Y)
 - Y-Code navigation

GPS IIR-M, IIF

GPS IIR-M – Basic GPS capability plus

- 2nd civil signal (L2C)
- M-Code (L1M & L2M)

GPS IIF – GPS IIR-M capability plus

- 3rd civil signal (L5)
- 2 Rb + 1 Cs Clocks
- 12 year design life

GPS III

- Backward compatibility
- 4th civil signal (L1C)
- 4x better User Range Error than GPS IIF
- Increased availability
- Increased integrity
- 15 year design life

New Civil GPS Signals

| Signal | Benefits | # of Satellites Broadcasting Now | Availability on 24 Satellites |
|--------|--|-------------------------------------|----------------------------------|
| L2C | Meets commercial needs for ionospheric correction, higher effective power, etc. | 10 | ~2018 |
| L5 | Meets requirements for safety-of-life transportation; enable triple-frequency positioning techniques | 3 | ~2021 |
| L1C | GNSS interoperability; performance improvements in challenged environments | Will start with GPS III in 2015 | ~2026 |

Testing of new Civil Signal Navigation Message (CNAV) began in June 2013

Status of GPS III and OCX

- GPS Block III, Satellites 1-8
 - Non-Flight Satellite Testbed completed testing
 - First 4 satellites now in production
- GPS Block III, Satellites 9+
 - On track to add search and rescue payload (SAR-GPS) and satellite laser retroreflectors
 - Studying options for dual launch and other cost savings
- Next Generation Operational Control System (OCX)
 - Block 0 (GPS III launch and checkout): **2014**
 - Block 1 (CNAV for L2C and L5): **2016**
 - Block 2 (L1C and M-Code): **2017**

Summary

- GPS performance is better than ever and will continue to improve
 - Testing new civil GPS signals this summer
 - More space and control segment upgrades coming